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Eigenvibrations of a simply supported beam with elastically attached load

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Abstract

© The Authors, published by EDP Sciences, 2018. The nonlinear differential eigenvalue problem describing eigenvibrations of a simply supported beam with elastically attached load is investigated. The existence of an increasing sequence of positive simple eigenvalues with limit point at infinity is established. To the sequence of eigenvalues, there corresponds a system of normalized eigenfunctions. To illustrate the obtained theoretical results, the initial problem is approximated by the finite difference method on a uniform grid. The accuracy of approximate solutions is studied. Investigations of the present paper can be generalized for the cases of more complicated and important problems on eigenvibrations of plates and shells with elastically attached loads.

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